

ASR Fall WGM Session Summary

Title: CLWG-QUICR/ICEPRO—Ice characterization and related uncertainties

Time: Wednesday, November 19, 2014

The beginning of the session was devoted to a single QUICR presentation on a new method of implementing uncertainty analysis in retrievals. The method will provide an uncertainty value associated with each retrieval value, and was well-received by the group.

The remainder of the session was devoted to the ICEPRO focus group, which is now in a mature stage (focus group approved in March 2014). The group's white paper (http://asr.science.energy.gov/science/working-groups/clc/docs/icepro_whitepaper_20140130-1.pdf) identifies twelve specific milestones or project deliverables over a five-year horizon. Some involve PIs extending their funded project to cover deliverables requested by other PIs; others are collaborations between two or more PIs. At this session no new deliverables were identified nor major changes made in existing deliverables. Each deliverable discussion was led by a group PI who included work from one or more group PIs to cover current status. A single presentation summarizing the discussion is available at

(https://www.dropbox.com/s/u4hwufw2zq7mmnm/CLWG_CAPI_JointIceSession.pptx). A brief summary of *current progress on identified deliverables (see white paper)* follows:

#1—Single-particle databases of ice properties: first databases delivered, currently in use by multiple group PIs, manuscripts completed or in preparation

#2—Dependence of ice properties on environmental conditions: new results from multiple PIs, manuscripts in preparation

#3—Spectral radiative closure during ISDAC: in new calculations using LES results and ice properties, ice had to be scaled up to reach agreement on test pixel, difficult parts done

#4—Spectral radiative closure at SGP: clear-sky radiative closure (first step) identified design flaw in SWS instrument, instrument characterizations need improvement (ongoing)

#5—Improved ice properties in retrievals: MC3E in situ data have been applied to MC3E-specific NEXRAD radar retrievals of ice PSDs (manuscript in preparation)

#6—Ground-based remote sensing of ice habit: microphysical regimes identified in MMCR data reported in 2013 publication, confirmed upgrade to NSA radar is happening

#7—Upgrade CAM5 microphysics: cloud ice and snow classes now combined and new m-D and A-D relationships incorporated with look-up table approach, now testing (SCM, GCM)

#8—High-resolution MC3E simulations: 2-moment outflow vs in situ PSDs agree poorly, bin microphysics stratiform melting layer agrees with roundness, manuscripts in prep.

#9—Improved ice in models: new results from models with habit evolution of unrimed and rimed ice (manuscripts in preparation and in press)

#10—Ice uncertainties in models: SPARTICUS 3D simulation results use traditional sensitivity test approach (in prep.), recent manuscript describes PSD uncertainty

#11—Ice optical properties: recent manuscript reports fast optical properties model dependent on element aspect ratios, now being implemented in SPARTICUS simulations

#12—Measurement gaps: process-oriented analyses added to deliverables (aggregation, multi-mode PSD fits), identified poorly sampled regions (So. Ocean, Arctic cirrus)